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## LONG-TERM EFFECTS OF ALCOHOL POLICIES

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considerably by developing elasticities based on measurement of what happens in situations of actual change.

A further refinement might be to take into account the possibility of alternative pathways from alcohol pricing to health and social problems. The Meier *et al.* model takes a well-trodden pathway followed at least since Bruun *et al.* [12] in 1975: price and other control measures influence consumption level, which in turn influences levels of problems. However, the crucial issue for public health is whether the intervention in pricing influences the levels of problems, and it can do this in ways which do not pass through the consumption level, for instance by influencing contexts of drinking and after drinking. Some years ago, the economist Philip Cook pioneered this direct approach in analysis [13], and also examining this path might be a useful addition.

In all, the work presented by Meier *et al.* represents an impressive piece of modelling, offering a rich feast for policy discussions but, as the authors concede fully, it is limited by the data which are available. There is much work for the future in collecting more appropriate and more reliable data from which to develop robust estimates of policy impacts. In the meantime, modelling exercises such as this are a useful contribution to thinking and action on alcohol policies, but it is important not to reify the results and to keep in mind the uncertainties inherent in what is presented.

#### Declarations of interest

None.

**Keywords** Alcohol problems, economic modeling, differential effects of policy, price elasticity, validity of drinking surveys.

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#### LONG-TERM EFFECTS OF ALCOHOL POLICIES: AN ECONOMIC PERSPECTIVE

In this issue of the *Addiction*, Meier, Purshouse & Brennan [1] (hereafter 'the authors') present modelling results of different alcohol pricing policies. Excessive alcohol consumption is related to many life-threatening diseases [2]. Policies reducing alcohol abuse increase population health, with further beneficial effects to be expected outside the health care sector. The authors argue that heterogeneous modelling is needed to understand the differences in effects of policies affecting various types of alcohol consumption; for instance, consumption by youth in bars versus supermarket purchases by adult men. They present their outcomes as net present values, without paying explicit attention to the timing of effects. This commentary focuses upon the long-term effects of alcohol policies from an economic perspective. We argue that once different alcohol consumption subgroups are distinguished, the time dimension becomes crucial.

To illustrate the time dimension, let us consider the life of a hypothetical person called Joe. Joe works in a factory

and each day after work drinks five beers. At weekends he goes to a bar with friends and has about 10 beers. At age 50 he suffers from a heart attack, which causes him to cut back on work for a few months. For the rest of his life Joe is on medication. He retires at age 65 and dies at age 70 from a fatal stroke. Joe's life could have taken a different course. Had he changed his alcohol consumption because of, for instance, a major tax increase, Joe would never have had a heart attack. In this parallel world of Joe, he would have gained quality of life as of age 50. Moreover, his boss would have been happy because Joe would not have needed to cut back on his work. He would not have had a stroke, but would have lived until 85, although suffering from dementia from age 75. That is, he would have lived longer and enjoyed more of his pension. However, in some of these so-called 'added' life years his quality of life would have been severely diminished. Of course, this is a stylized example, but it shows the important mechanism of postponement. By avoiding a heart attack, death is postponed. However, at later age substitute diseases cause losses in quality of life and add to health care utilization.

On a macro level a decrease in alcohol consumption leads to a decrease in the incidence of alcohol-related diseases, such as stroke and cardiovascular disease, but an increase in age-related diseases in a now older population. Similar mechanisms are at work in the case of tobacco control and overweight reduction [3,4]. With respect to health care costs, the increase in health care utilization might even outweigh the savings of avoiding alcohol-related diseases [5]. If we broaden the scope and look at productivity, similar mechanisms are present. We saw in Joe's example that the avoidance of a heart attack resulted in net productivity gains, but also in additional years of retired life. In general, added years occur at older, usually less productive ages [6]. While young people in general produce more than they consume, the reverse can be said of older people [7].

Turning to heterogeneity and combining it with the time dimension, all diseases related to alcohol occur more frequently at older ages, and therefore health effects are long-term effects. Different pricing policies affect different groups in society differently, as stressed by the authors. Policies that affect younger drinkers will have health effects further into the future than policies targeting older drinkers. Taking into account discounting of future effects, therefore, could mean that the same health effects would be valued less in a younger age group than those in an older age group [8]. Ultimately, cost-benefit estimates could shed light on the value for money of the different policy options, accounting for all relevant health effects and related costs [9].

The main advantage of modelling is that by specifying mathematical relations between epidemiological quanti-

ties new insights and outcomes can be generated that cannot be estimated directly from data [10]. Modelling can thus be seen as a form of evidence synthesis. The authors have presented an impressive modelling exercise in which they stress the importance of modelling heterogeneity. However, the modelling approach used by the authors does not allow us to quantify effects of policy over time, but rather attributes effects *ex post*. As we have argued above, the different policies probably differ in the timing of their effects. A next step therefore might be to quantify the dynamic effects of alcohol policies.

#### Declarations of interest

None.

**Keywords** Alcohol, cost effectiveness analysis, modeling.

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## BEYOND TAX: THE NEED FOR RESEARCH ON ALCOHOL PRICING POLICIES

Numerous factors influence the price of alcoholic beverages, from the type and quality of the product to where it is purchased. While higher excise taxes on alcoholic beverages are the primary policy lever for raising prices, there are a variety of other policies that do the same. In contrast to the large and continually growing body of research that shows that higher alcoholic beverage excise taxes, by raising price, reduce drinking and its consequences [1,2], almost nothing is known about the impact of policies regulating wholesale and retail distribution and pricing. The same is largely true when it comes to understanding the impact of policies that target the industry pricing promotions that can vary with quantity, location and other factors.

In their paper in this issue of *Addiction*, Meier and her colleagues add to the very limited evidence base on these issues [3]. Using unique data from England that include a variety of measures of the types and quantities of alcoholic beverages consumed, where these beverages are purchased, and the prices paid for them, they explore the potential impact of a range of policies that affect alcoholic beverages prices and drinking among different population subgroups. Consistent with extensive previous research, they find that alcohol prices have a significant impact on drinking behavior—from choice of beverage and location to the quantity consumed. Their unique contribution, however, is in demonstrating that policies that impact prices differentially—from minimum pricing policies to bans on discounting—have different effects on drinking that vary with the type of drinking (e.g. moderate, hazardous and harmful) and across drinkers (based on gender and age). As Meier and her colleagues conclude, a mix of policies that target price is called for when governments adopt pricing policies aimed at curbing the harmful consequences of drinking.

As the authors note, the approach they have taken can be adapted to other countries where there are similarly complex policies that have different effects on alcoholic beverage prices. Such research would be quite timely in the United States. Following the repeal of Prohibition in the United States, states adopted many varied combinations of policies governing the wholesale and retail distribution of alcoholic beverages as part of the creation of a 'three-tier system' for alcohol distribution [4]. These include state control over wholesale and/or retail distribution of at least some beverages (which allows the state to

directly set prices for the controlled beverages), minimum pricing policies, bans on quantity discounts, requirements that wholesalers post and hold their prices and limits on price promotions (e.g. bans on 'happy hour' specials and free samples). However, research on the impact of these policies on the prices drinkers pay for alcoholic beverages, drinking behavior and the consequences of drinking is almost non-existent [2].

In recent years, these policies in US states have been eroding in the face of legal challenges from the alcoholic beverage industry over their perceived anti-competitive effects. In Maryland, for example, one large regional retailer has challenged the state's ban on quantity discounts for wine and spirits at the wholesale level and the related price post-and-hold requirements (*TFWS v. Schaefer et al.*). In Washington, a large national retailer has challenged a broader set of policies regulating wholesale distribution that includes minimum mark-up, cash payment and direct deliver provisions, in addition to the state's ban on quantity discounts and related post-and-hold requirements (*Costco v. Hoen et al.*). The states have used a '21st amendment' defense to oppose these legal challenges, arguing that these policies are consistent with the state interests in promoting temperance and reducing the harms from excessive drinking and the authority granted to states by the constitutional amendment repealing Prohibition. To date, states' ability to defend these policies has been hampered by the lack of published evidence on the impact of these policies on alcoholic beverage prices, drinking and its consequences. The type of evidence Meier and her colleagues' provide for England, adapted appropriately to the US environment, would be invaluable in responding to the inevitable future challenges to comparable policies in other states.

### Declaration of interest

The author has served as an expert witness on behalf of Maryland (in *TFWS v. Schaefer et al.*) and Washington (in *Costco v. Hoen et al.*).

**Keywords** Alcohol, price, policy.

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